AMENDMENTS TO THE SPECIFICATION

Please replace page 7, lines 12-18 with the following paragraph:

Higher-order Peano-Gosper ~~fractal~~ fractile arrays (i.e., arrays with $P>1$) are recursively constructed using a formula for copying, scaling, rotating, and translating of the generating array defined at state 1 ($P=1$). Equations 1-14, below, are used for this recursive construction procedure. Figures 1A-1C illustrate a graphical representation of the procedure. The array factor (i.e., radiation pattern) for a stage P Peano-Gosper ~~fractal~~ fractile array is expressed in terms of the product of P 3x3 matrices which are pre-multiplied by a vector $\boldsymbol{A}$ and post-multiplied by a vector $\boldsymbol{C}$.

Please replace page 10, lines 1-11 with the following paragraph:

With reference to Figure 4, a plot of the normalized array factor versus θ for a stage 3 Peano-Gosper ~~fractal~~ fractile array with $\varphi = 0°$ is illustrated. Curve 410 represents the corresponding radiation pattern slices for the Peano-Gosper array with element spacings of $d_{min} = \lambda$. Curve 420 represents radiation pattern slices for a Peano-Gosper array with elements spacings of $d_{min} = \lambda/2$. Likewise with reference to Figure 5, a plot of the normalized array factor versus θ for a stage 3 Peano-Gosper ~~fractal~~ fractile array with $\varphi = 90°$ is illustrated. Curve 510 represents the corresponding radiation pattern slices for the Peano-Gosper array with element spacings of $d_{min} = \lambda$ and curve 520 represents radiation pattern slices for a Peano-Gosper array with element spacings of $d_{min} = \lambda/2$. For Figures 4 and 5, the angle φ is measured from the x-axis and the angle θ is measured from the z-axis.

Please replace page 15, lines 1-14 with the following paragraph:

Referring to Figure 10, a plot of the normalized array factor versus θ for $\varphi = 0°$ is illustrated where the main beam of the Peano-Gosper ~~fractal~~ fractile array is steered in the

direction corresponding to $\theta_{\circ} = 45°$ and $\varphi_{\circ} = 0°$. The antenna element phases for the Peano-Gosper ~~fractal~~ fractile array are chosen according to

$$\beta_n = -kr_n \sin \theta_{\circ} \cos(\varphi_{\circ} - \varphi_n) \tag{25}$$

Curve 1010 shows the normalized array factor for a stage 3 Peano-Gosper ~~fractal~~ fractile array where the minimum spacing between elements is a half-wavelength and curve 1020 shows the normalized array factor for a conventional 19x19 uniformly excited square array with half-wavelength element spacings. This comparison demonstrates that the Peano-Gosper fractile array is superior to the 19x19 square array in terms of its overall sidelobe characteristics in that more energy is radiated by the main bean rather than in undesirable directions.

Please replace page 16, lines 1-6 with the following paragraph:

This invention also provides for an efficient iterative procedure for calculating the radiation patterns of these Peano-Gosper ~~fractal~~ fractile arrays to arbitrary stage of growth *P* using the compact product representation given in equation (6). This property may be useful for applications involving array signal processing. This procedure may also be used in the development of rapid (signal processing) algorithms for smart antenna systems.